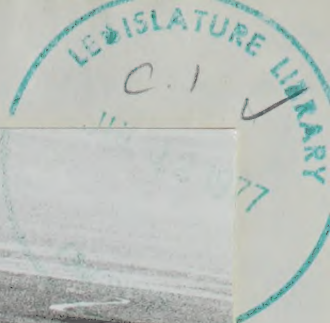


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Alberta Executive Council  
(1970-#5)



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Death Of A Delta - a Brief to Government



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# DEATH OF A DELTA







The frontispiece is a picture of the dry basin of Lake Mamawi in the Peace-Athabasca delta, looking eastward towards Lake Athabasca.

The picture was taken in September, 1969 by the Canadian Wildlife Service.



Edmonton, Alberta  
June 5, 1970

The Premier of the Province of Alberta,  
The Hon. Harry E. Strom  
Legislative Building  
Edmonton, Alberta

Dear Sir:

We the undersigned are familiar with the rapid ecological and hydrological changes taking place in the Peace-Athabasca delta of northeastern Alberta. Those changes have occurred as a direct result of the regulation of the Peace River by the W. A. C. Bennett Dam in British Columbia and will be permanent unless prompt action is taken to reverse them. The accompanying brief expresses our strong concern for the damage that is being caused to the land and the people of the region.

Fortunately, the situation does not appear to be without remedy, provided that certain actions are taken at once. We urge that you consider at least three essential steps to meet the crisis:

1. Temporary partial obstruction of the outflow channels from Lake Athabasca to the Peace River, to be commenced in the summer of 1970.
2. Setting up a task force to plan more complete remedial measures in 1971 and 1972, utilizing the best expertise available in Canada.



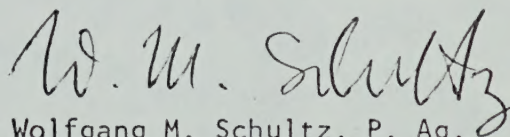


3. Negotiating at the highest levels with the governments of the adjoining provinces, and the government of Canada, to secure co-operation and to clarify questions of liability and compensation for damages suffered by this province and its residents.

May we draw your attention also to the fact that the Water Resources Centre of the University of Alberta is sponsoring a scientific symposium about the Peace Athabasca delta in Edmonton on October 29, 1970. This meeting will serve to draw together the knowledge gathered from various studies in the past few years, and especially during the coming summer. Such studies are being done by the University of Alberta and by agencies of the governments of Alberta and Canada.

Please be assured that the undersigned persons are anxious to co-operate in any way possible in the solution of the unforeseen but serious situation that has developed in the Peace-Athabasca delta.

Respectfully yours,



Wolfgang M. Schultz, P. Ag.  
Chairman of the Executive Committee  
University of Alberta Water Resources  
Centre

and:

Thomas Blench, P. Eng., Dept. of Civil Engineering, Univ. of Alberta  
Rorke Bryan, Dept. of Geography, University of Alberta





W. A. Fuller, Chairman, Dept. of Zoology, University of Alberta

Rolf Kellerhals, P. Eng., Hydraulic Engineer, Alberta Res. Council

G. R. Kerr, Chief Wildlife Biologist, Fish & Wildlife Division,  
Alberta Government

Maureen Molot, Student, Dept. of Political Science, Univ. of Alberta

Charles R. Neill, P. Eng., Hydraulic Engineer, Alberta Res. Council

Julian Nowicki, Geographer, Prov. Parks Div., Alberta Government

M. J. Paetz, Chief Fishery Biologist, Fish & Wildlife Division,  
Alberta Government

Roger Poppe, Anthropologist, Alberta Human Resources Res. Council

Stuart B. Smith, Director, Fish & Wildlife Div., Alberta Government

Ward E. Stevens, Biologist, Canadian Wildlife Service

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## DEATH OF A DELTA --- A BRIEF TO GOVERNMENT

The 1000 square mile delta of the Peace and Athabasca Rivers near Ft. Chipewyan, Alberta comprises a unique ecological system of lakes and rivers (Figures A and B). More than half of the area lies within Wood Buffalo National Park where formerly the wide sedge meadows provided food for the major herd of bison in North America, and the shallow lakes supported thriving populations of muskrats, beavers and waterfowl. Recent studies show that profound changes have taken place there because the regulation of the Peace River by the W.A.C. Bennett Dam in British Columbia has robbed the delta of the spring floods that are necessary to fill its many lakes, and to maintain the water levels in Lake Athabasca. Those changes will be permanent unless appropriate action is taken soon. We collectively would like to express our grave concern for the future of Lake Athabasca and its associated lakes, for the natural resources found therein, and for the 1300 Cree, Chipewyan and Metis people dependent upon them for a livelihood.

Apparently, no one has considered the loss in human values that the Bennett Dam has caused; only the economic benefits to British Columbia have been considered.





## THE SITUATION

1. Hydrology

The productivity and uniqueness of the Peace-Athabasca delta is entirely the result of its hydrological regime. Before construction of the dam, the Peace River had an extremely variable flow, characterized by spring flows in the order of 350,000 cubic feet per second (cfs), followed by a gradual decline during summer and fall to winter flows of about 15,000 cfs. Lake Athabasca and the major lakes of the delta are connected to the Peace River through several outlet channels (Figures B and C). During the spring flood, the water level in the Peace River at the delta generally exceeded the level of Lake Athabasca and the other delta lakes. Consequently, the flow in the outlet channels changed direction and large inflows from the Peace River caused the lakes to rise rapidly by 6 to 8 feet, to levels between 688 and 692 feet. At such high stages of water almost the entire area was under water, but such yearly flooding is essential to maintain the ecology of the delta.

The Federal Inland Waters Branch has produced the only published study of flows and water levels in the delta<sup>1</sup>, a study which is unfortunately, inadequate and incorrect in several respects. It asserts that Lake Athabasca levels should not drop below 682 feet





FIG. A LOCATION OF THE PEACE-ATHABASCA DELTA

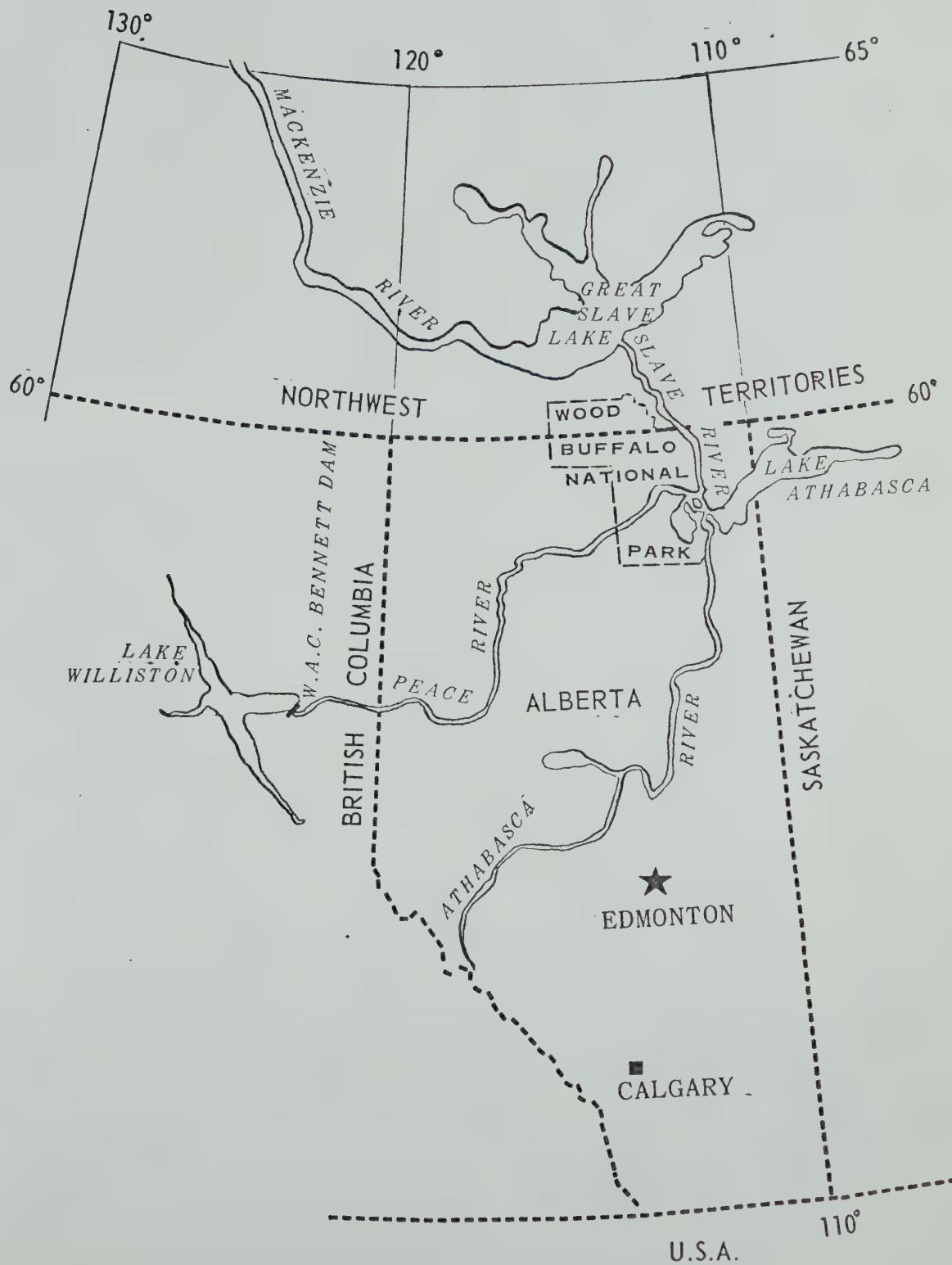
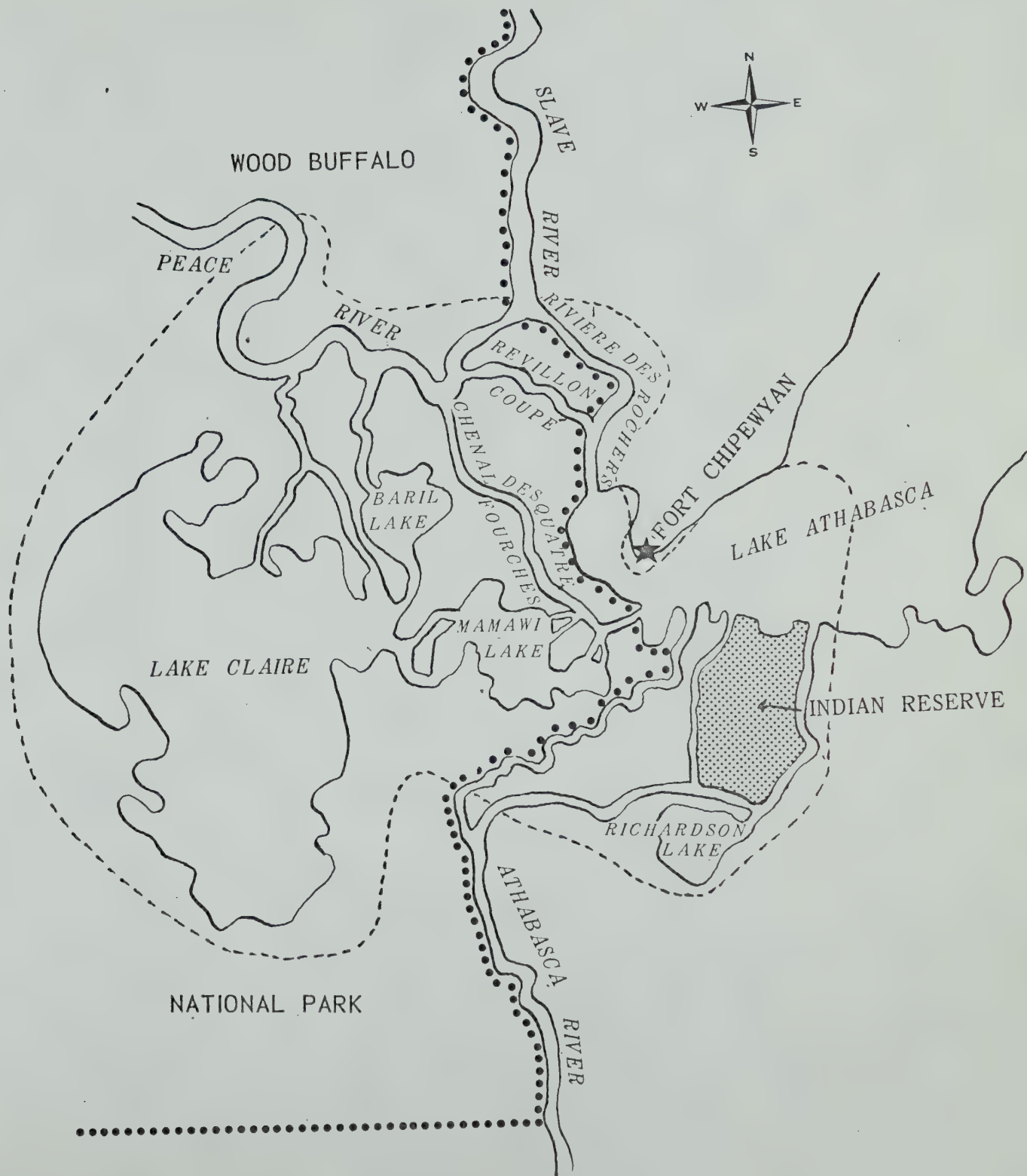






FIG. B THE PEACE-ATHABASA DELTA





in winter, yet during February of 1970 a level of 675 feet was measured (Figure D). Also, in a sweeping final statement the downstream effects of Bennett Dam are called "beneficial because of reduction in flood peaks and increases in winter flows"<sup>1</sup>. Yet, there have never been any significant flood problems along the Peace River, and the increased winter flows of 1969-70 were unable to prevent the catastrophic drop in the level of the delta lakes. All the other adverse effects of the dam, such as interrupted navigation, deterioration of national park values, and the elimination of subsistence trapping and commercial fishing in Lake Athabasca, are entirely ignored.

Unfortunately, the return of wetter years, and the completion of the filling of the storage reservoir behind Bennett Dam will bring no relief. Nothing but the previously high spring floods in the Peace River can restore the lake levels, unless control weirs are built in the delta.

## 2. National Park Values

The National Parks Policy states that "The basic purpose of

<sup>1</sup> Coulson, A. and R. J. Adamcyk - The effects of the W.A.C. Bennett Dam on downstream levels and flows. Technical Bulletin No. 18, Department of Energy, Mines and Resources, Inland Waters Branch, Ottawa, 1969.





FIG. C    **FLOW OF WATER IN THE OUTLET CHANNELS**

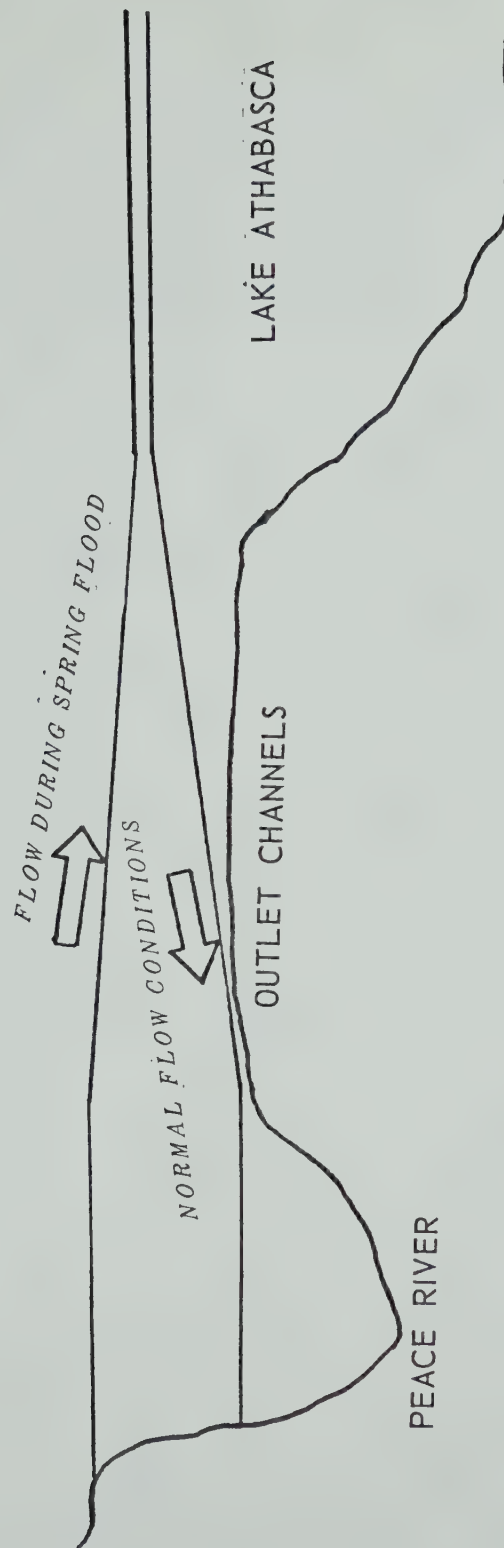
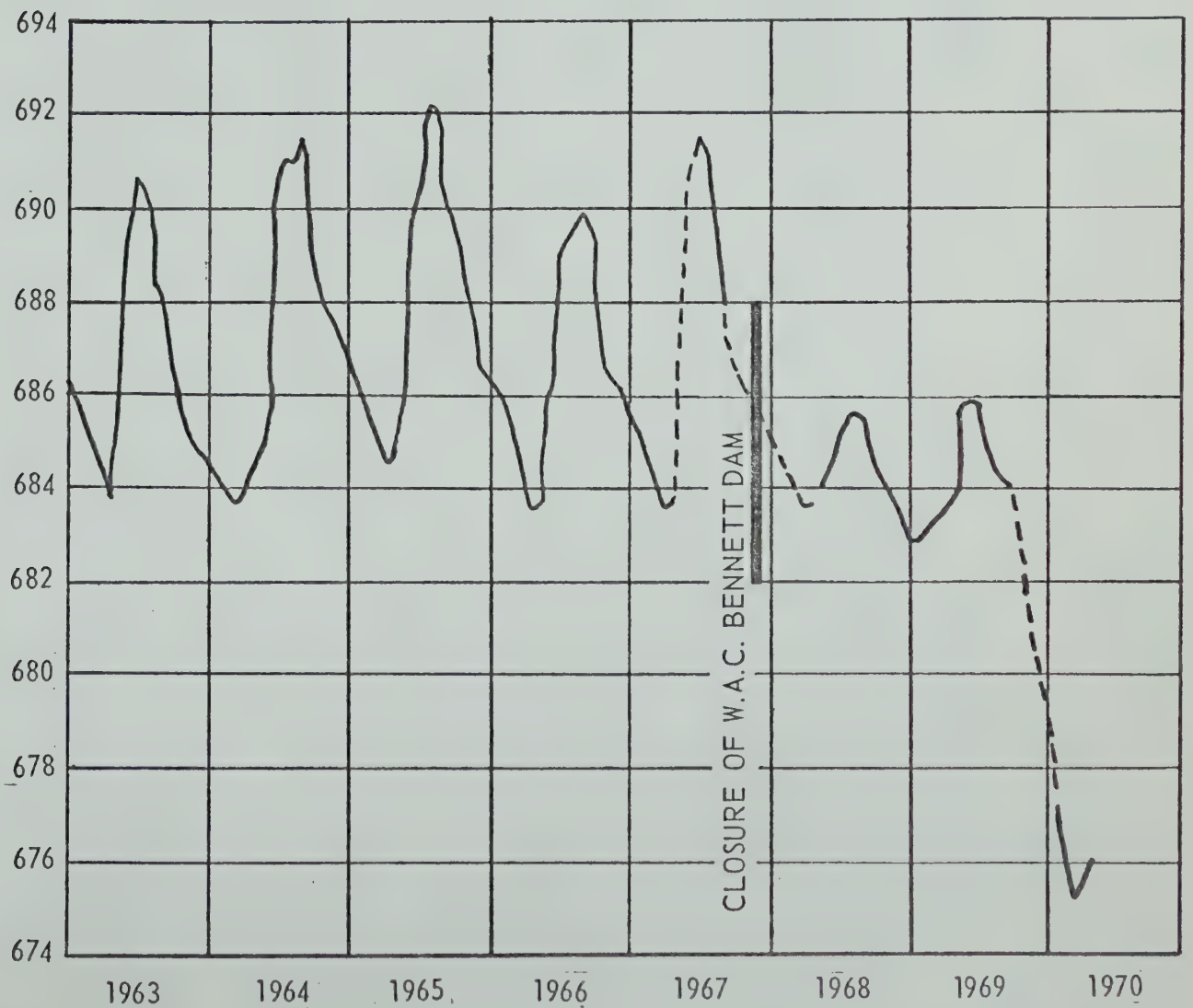
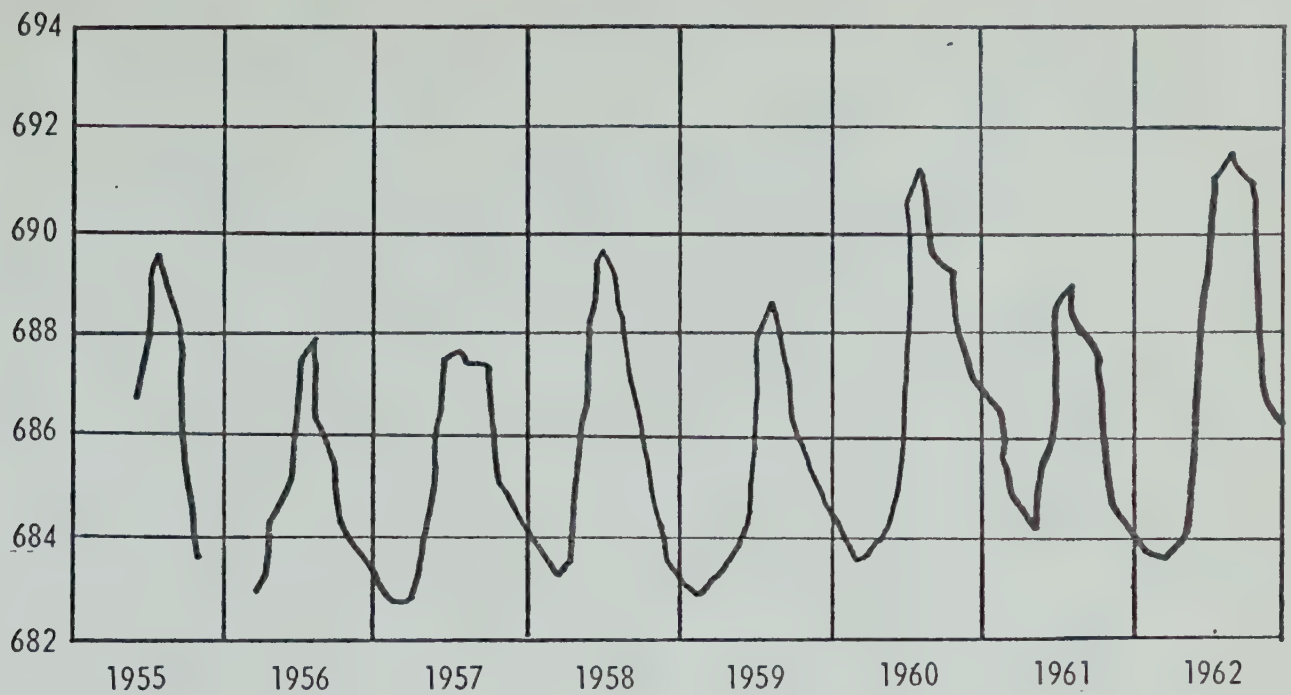






FIG. D LAKE ATHABASCA LEVELS 1955-1970





the National Park system is to preserve for all time areas which contain significant geographical, geological, biological or historic features as a national heritage for the benefit, education and enjoyment of the people of Canada". Despite that statement of dedication to future generations of Canadians, extensive and significant changes have been allowed to occur in Wood Buffalo National Park, as a consequence of the lowering of the water levels in the vast Peace-Athabasca delta. What once was a fascinating and varied natural complex of lake and marsh is fast becoming a succession of isolated mud flats whose communicating streams are drying up. The Park was established originally for the protection of the wood bison but the replacement of their preferred sedge meadows by unpalatable grasses and dense thickets of willows may seriously restrict the supply of natural forage available to them.

### 3. Waterfowl Use

The lakes and marshes of the Peace-Athabasca delta are one of the most important areas for migratory waterfowl in all of Alberta. They are, in fact, unusual because they receive birds from each of the four major flyways in North America. Twenty-two species of ducks, five species of geese, swans, pelicans, grebes, gulls and great flocks of shorebirds have always appeared there each year on migration. Even the rare and spectacular whooping





cranes feed and rest in the delta enroute to their nesting grounds only a few miles northward. The drying out of the Peace-Athabasca delta is making the whole area less available to North American waterfowl, and is denying to them a most important traditional resting, breeding and moulting sanctuary.

#### 4. Fur Trapping

Among the fur mammals inhabiting the Wood Buffalo National Park were muskrats and beavers that were most abundant in the marshes and channels comprising the Peace-Athabasca delta. Formerly they could persist in the delta because the waters were deep enough to provide them with shelter throughout the winter. Now that most of the water bodies are so shallow that they freeze to the bottom, those species no longer have secure habitat and food during winter and are disappearing as a fur resource for the local people.

#### 5. Fishing and Hunting

Fish populations in the Peace-Athabasca delta are adapted to a regime of annual water level fluctuations. All of the shallow lakes, sloughs, river channels and backwaters of the area contain characteristic communities of plants and animals which depend for their existence on the annual spring floods of the large rivers. The previous high lake levels allowed flooding and





recharging of the delta with nutrients carried in the silty waters of the Peace and Athabasca Rivers. Removal of this natural "fertilization" has already caused drastic changes in the delta channels and in Richardson Lake.

Winter habitat and spawning areas for pike have been eliminated in all but the main channels of the delta system. Walleye (pickerel) spawning in the Maybelle River adjacent to Richardson Lake suffered mortality in 1968 and 1969 that was never previously observed in the five years of a research project carried on there since 1965. Spawning areas for cisco (tullibee) on the shores of Lake Athabasca have lain exposed to the elements during the past two winters. It is expected that the commercial fishery in Lake Athabasca will collapse within three to five years as recruitment to the harvestable fish populations of walleye, pike, and lake trout declines, and as stocks of cisco are eliminated as the basic food supply for the carnivorous species listed above. Aside from the commercially harvestable fish, the availability of various species for native domestic consumption will be drastically reduced.

Hunting potential in the delta area is largely oriented towards waterfowl. During the past five years there has been a growing interest by sportsmen in hunting the variety of ducks and geese which have used the delta as a breeding and staging



area. The local people have been increasing their activities as guides to waterfowl hunters, in addition to their traditional involvement in waterfowl hunting for food. As the vegetation changes, and as the area suffers further drying, the large waterfowl populations will be reduced to remnants of their former size. Because of the funnelling of birds from the four major flyway routes into the delta, hunting for ducks and geese could be significantly affected in southern Alberta, and in the United States as well.

If the Peace-Athabasca delta is sacrificed as a major waterfowl area, the vast populations wanting to go there would have to depend upon the Hay-Zama Lakes complex, which already is in grave danger of pollution from petroleum extraction. Present conditions on the Peace-Athabasca delta pose a threat to the elimination by direct and indirect effects, of one of the largest waterfowl hunting potentials in North America.

#### 6. The Local Economy

The muskrats and beavers of the delta and the lake fish represented not only a cash income to the people of Ft. Chipewyan but also a source of feed for the local dog teams which supported the trapping industry. In addition, the geese and ducks which the local people hunted for food not only migrate through in





reduced numbers, but feed in the shrunken marshes surrounded by wide mud flats, making them impossible to approach near enough to shoot.

This disappearance of a way of life, even though it was only subsistence living for most, has taken many people off the trap lines and placed them on welfare. The drying out of the delta lakes will ensure that even those people who are willing and able to trap will become year-round welfare recipients. Jobs are hard to find in this area of northern Alberta, and in the settlement of Ft. Chipewyan, where the average income is only \$1500. per family, the loss of supplemental food sources can be most serious. Further, the drop in water levels has forced the local people to go 6 to 8 miles farther out into Lake Athabasca for their fishing than they ever had to do in the past.

#### 7. Transportation

Transportation along the river systems has been affected as well. The Department of Public Works has had to dredge out into Lake Athabasca at least one and one-half miles farther as a result of the lowered lake levels. Barges are the cheapest mode of transportation into Ft. Chipewyan and if their use is restricted or stopped, the local people will have to depend entirely on aircraft to bring in goods at prohibitively high prices. Otherwise, the government will be forced to build a



year-round road into the area. The barge traffic provides general supplies not only to communities like Ft. Chipewyan, but also carries equipment and supplies to mining and oil companies downriver, and to Uranium City and other points in northern Saskatchewan.

8. Recreational Values and Tourist Potential

The recreational potential of Lake Athabasca rests primarily on angling, viewing of wildlife, and some hunting, boating and beach activities. Previous sections have stated that both fish and wildlife are being severely affected by the lower lake levels, so consequently the recreational potential will be affected as well. Certainly, boating activities will be hindered because of poor access and the presence of unaesthetic mud flats. Although it is not certain what eventual effects the lowered water levels will have on the beaches of Lake Athabasca, the overall potential of the lake already has been adversely affected as a recreational area for tourists and native Albertans alike.

9. Human Values and Civil Rights

The disruption and dislocation of a way of life for many northern Alberta people have not been considered. They are to be deprived of a means of livelihood without so much as an attempt being made by provincial or federal governments to investigate in advance in what ways the construction of the dam would affect





them. They should, as residents of Alberta, have been adequately informed as to the consequences of regulation of the Peace River, and they should have had representations made on their behalf before it was too late to do anything about it.

#### IMPLICATIONS

The flow regulation imposed on the Peace River by the operation of the Bennett Dam in British Columbia is having grave consequences for northeastern Alberta, and is causing serious damage. This is not the time to fix blame, but to take remedial action and to learn the costly lessons we are presently being taught.

1. In regulating the flow of the northern rivers, attention must be given to an entirely new set of conditions which do not occur in the settled part of Canada. In planning future actions, it is imperative that we proceed with more circumspection and give proper attention to the knowledge being accumulated outside the engineering profession.

There are three large deltas in the Mackenzie River system; the Peace-Athabasca delta, the Slave delta and the Mackenzie delta. They are dependent upon a yearly spring flood to maintain their fertility and to grow those kinds of plants necessary for



the wildlife upon which the local people depend. The reduction or elimination of spring floods by large water storage or diversion schemes will cause many of the lakes in the deltas to become acidic and barren, and the lowering of their water levels will make them so shallow that they no longer can support fur mammals and fish over winter. A delta is a dynamic entity that grows at its downstream end as it matures at its upstream end. To eliminate the annual spring flooding is to cause the whole system to die.

2. The economic development of the North may require changes of the natural regime. Given the state of our knowledge it is inexcusable, however, that valuable natural resources are being wasted by default. Proper, timely and comprehensive planning could have avoided much of the damage now being wrought in the Peace-Athabasca delta; proper planning is imperative in the future to reconcile the objectives of economic development and resource conservation.

3. The senior governments have the role of arbiters between the short-run gains accruing to developers, and the long-term gains accruing to society at large from careful husbandry of nature's bounty. Much knowledge now exists, albeit not necessarily in the proper places, for governments to play a constructive role in fulfilling their tasks of allocating the rights to the use





of Crown-owned resources in such a way that short-term and long-term objectives are reconciled on a rational basis.

4. The foregoing has particular relevance in any consideration of north-south water diversions, whether on a province-wide, national or international scale.

5. There are apt to be national and international repercussions if deterioration of the Peace-Athabasca delta adversely affects the continental migratory waterfowl populations.

6. The Peace River flow regulations will have a traumatic effect upon the life and the livelihood of the local population in the delta region. There is apt to develop political discontent and widespread economic hardship. To alleviate this the government will be forced to pay out total welfare to all native residents in the area (and with subsistence supplements reduced, increased payments to those already on the welfare rolls), or else bring industry into the area to create new sources of income. This would imply drastically increased training programs extended over many years. Sadly, the one potential new industry which could best be developed in the area, that of recreation and tourism, will be destroyed by the regulation of the Peace River, unless remedial action is taken.



7. The loss of sources of income and the destruction or deterioration of property values downstream from the Bennett Dam may give rise to civil damage suits. There are other consequences that may also be challenged in the courts.

8. Alberta will continue to be vulnerable to damage of the kind now observed unless binding agreements are achieved with British Columbia and the Government of Canada respecting the regulation of border waters, either through negotiations or through the courts.

#### RECOMMENDATIONS -

1. The Government of the Province of Alberta should immediately initiate a crash program to develop Emergency Water Management Measures to allow the delta system to survive until more permanent remedies are found. As a first step the rapids in the Riviere des Rochers could be obstructed during 1970 in order to raise lake levels sufficiently to halt the explosive ecological changes now occurring.

2. The governments affected are urged to initiate a thorough study of the present and anticipated changes in the delta region in order to develop permanent remedial measures based



upon hydrological and biological considerations.

3. Insofar as the Government of Alberta has the duty to protect the rights of the Crown vested in it, as well as the property rights of its residents, we recommend that the Government of the Province demand restoration of the status quo ante from those who knowingly or unknowingly caused damages to happen in the Peace-Athabasca delta that only now are becoming apparent. If restoration cannot be obtained, the Government should take immediate steps to appoint appraisers familiar with the kinds of damages being caused in order that compensation may be demanded. Such mitigation would allow the financing of the above remedial measures, and also compensate the Crown and those residents of Alberta directly affected.

4. Insofar as the Government of Canada has duties to safeguard the rights of the Crown with respect to Wood Buffalo National Park, the Migratory Birds Treaty, and Acts in behalf of the Treaty Indians residing in the region affected, it should institute similar action to safeguard the rights being threatened.

5. In view of the likelihood that future development will further affect the Peace-Athabasca delta, as well as other unique habitats, it is strongly recommended that studies be





undertaken of the ecological consequences of water management planning in the Saskatchewan-Nelson Basin and the Peace-Mackenzie Basin. The intent must be to develop management principles that will allow the hydrological and ecological systems therein to continue to function in the foreseeable future for the benefit of present and future generations of Canadians.



Peace-Athabasca Delta Committee

June 15, 1970  
Box 600  
Edmonton 7, Alberta

# NEWS RELEASE

A group of Alberta scientists is appealing to the provincial and federal governments to save the Peace-Athabasca Delta, the 1000-square-mile expanse of lakes, marshes and sedge meadows in Northeastern Alberta. The Delta has been the traditional source of food, muskrat pelts and commercial fish for the local population in and around Fort Chipewyan. It is also known as a nesting and staging ground for migratory waterfowl of all four continental flyways. The sedge meadows are the staple forage of the wood buffalo. There is a huge untapped potential for hunting, fishing, nature study, sailing, boating and just about any other form of outdoor recreation.

The Peace-Athabasca Delta is a unique natural system. It depends upon the annual spring floods of the Peace and Athabasca Rivers to replenish the water in the lakes. Just as in the delta of the ancient Nile, failure of the floods plays havoc: muskrats won't breed, meadows will not be watered, ducklings and goslings will die, fish spawning grounds will disappear. For the local population this spells disaster. Not only does their source of income disappear, there won't even be enough fish and game for domestic use. This will force a self-sufficient people to ask for welfare assistance, unless alternative employment is found for them.

The Bennett Dam across the Peace River in British Columbia controls about half of the waters of the delta system. Behind the dam the spring waters are stored for release in the winter. This prevents the waters of the river to rise to a level necessary to replenish the delta. This will happen every year, not just during the three years it was supposed to take to fill the reservoir to capacity. The flow regulation imposed upon the Peace River probably spell "Death of the Delta" unless remedial action is taken.







One way of remedying would be to enjoin B.C. Hydro from retaining the life-giving waters of the annual spring run-off. This could be done without any cost to Alberta. More costly to the province would be retention structures across the major outlet channels. This would require the use of Athabasca water to refill the delta lakes - Lake Claire, Mamawi Lake, Richardson Lake.

Time is of the essence, because the water level has been much below normal for two years. The muskrat population has already declined and the economic loss is felt in Fort Chipewyan. (Letter of Stan Daniel to Premier Strom.) Willows and other less productive plants will establish themselves in the dried-out marshes, unless the water returns.

"The available scientific evidence suggests that the Delta is doomed unless quick action is taken. This seems to be one case where some action should be taken immediately, while further information is gathered to map out the most effective long-term solution to the problem," said to Dr. Wolf Schultz, chairman of the Committee. "A heavy responsibility rests upon us to try and prevent the wanton destruction of one of Alberta's unique landmarks. It is painful to see this delta destroyed by default. It is unjust to have the downstream users of the water pay in the form of lost income, to destroy their way of life, while British Columbia stands to reap all the benefits. There must be ways to right this uneven deal."

There are several studies now underway in the Delta. The Water Resources Centre of the University of Alberta is sponsoring a conference this fall to bring together all that is known about the water regime, the natural balance and the ways in which people make use of the bounties of nature in the delta. "Clearly more is needed than detached observation to solve the problem brought upon us, which is absolutely beyond control of the local people. We ask for constructive action."

